
ABSTRACT

A maskless stereo lithography method and apparatus for forming a three-dimensional object from a plurality of adhered laminae by exposing successive layers of a photo-curable material to a micro-focused energy beam generated by an array of Fresnel zone plates. The method includes the steps of (A) providing a controllable array of Fresnel zone plates; (B) forming a layer of material adjacent to any last formed layer of material in preparation for forming a subsequent lamina of the object; (C) exposing the material to the micro-focused energy beam to form the subsequent lamina of the object; and (D) repeating the steps of forming and exposing a plurality of times in order to form the object from a plurality of adhered laminae, wherein the array of Fresnel zone plates are employed to focus parallel beamlets of energy beam from a source so that the beamlets converge to an array of focal points at predetermined positions of a lamina in accordance with a computer-aided design file of the object.